

1 What is claimed is:

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3 1. A sensor for sensing the presence of a chemical vapor, the  
4 sensor adapted for interconnecting to an electrical monitor for  
5 measuring a reaction of the sensor to the chemical vapor, the  
6 sensor comprising,

7       a positive terminal, the positive terminal being conductive,  
8       a negative terminal, the negative terminal being conductive,  
9       the terminals adapted for interconnection to the electrical  
10 monitor, and

11       a film of organic conductive polymer nanofibers extending  
12 between the positive and negative terminal for producing a  
13 change in conductivity between the positive terminal and the  
14 negative terminal as monitored by the electrical monitor when  
15 the film is exposed to the chemical vapor.

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17 2. The sensor of claim 1 wherein,

18       the positive terminal and the negative terminal are made of  
19 gold.

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22 3. The sensor of claim 1 wherein the positive terminal and the  
23 negative terminal are made of gold and the conducting polymer  
24 is polyaniline, the sensor further comprising,

25       a thiol surface layer disposed between the terminals and the  
26 film.

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1       4. The sensor of claim 1 wherein,  
2           the polymer nanofibers are selected from the group  
3       consisting of polyaniline nanofibers, polypyrrole nanofibers,  
4       polythiophene nanofibers, polytoluidine nanofibers,  
5       polyanisidine nanofibers, polymethylaniline nanofibers,  
6       polyethylaniline nanofibers, poly2-alkoxyanilines nanofibers  
7       and poly2,5-dialkoxyanilines nanofibers.

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9       5. The sensor of claim 1 wherein,  
10       the polymer nanofibers are polyaniline nanofibers, and  
11       the chemical vapor is selected from the group consisting of  
12       an acid vapor and a basic vapor.

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14       6. The sensor of claim 1 wherein,  
15       the polymer nanofibers have diameters less than 500 nm and  
16       lengths less than 10  $\mu\text{m}$ .

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18       7. The sensor of claim 1 wherein,  
19       the polymer nanofibers are polyaniline nanofibers having  
20       diameters less than 500 nm and lengths less than 10  $\mu\text{m}$ .

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22       8. The sensor of claim 1 wherein,  
23       the polymer nanofibers are polyaniline nanofibers having  
24       distributed diameters of 50 nm.

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26       9. The sensor of claim 1 wherein,  
27       the polymer nanofibers are polyaniline nanofibers having  
28       distributed diameters of 30 nm.

1    10. The sensor of claim 1 wherein,  
2        the polymer nanofibers are polyanilin nanofibers having  
3        distributed diameters of 120 nm.

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